

<110> Avicore Biotechnology Institute Inc.

<120> Recombinant ScFv Antibodies Specific to *Eimeria* spp. Responsible  
for Coccidiosis

<130> Avicore-USA-1

<150> KR 2001-52934

<151> 2001-08-30

<160> 40

<170> Kopatentin 1.71

<210> 1

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> forward primer for PCR amplification of heavy chain variable  
region

<400> 1  
ggaggagacg atgacttcgg t

21

<210> 2

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> reverse primer for PCR amplification of heavy chain variable  
region

<400> 2  
gccgtgacgt tggacgagtc c

21

<210> 3  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> forward primer for PCR amplification of light chain variable  
region

<400> 3  
taggacggtc agggttgtcc c

21

<210> 4  
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<220>  
<223> reverse primer for PCR amplification of light chain variable  
region

<400> 4  
gcgcgtgactc agccgtccctc g

21

<210> 5  
<211> 51

<212> DNA  
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<220>  
<223> reverse primer for PCR amplification of heavy chain variable  
region

<400> 5  
ggcgaggatgc gctctggcggtggcgatcg gcccgtgacgt tggacgagtc c 51

<210> 6  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> reverse primer for PCR amplification of heavy chain variable  
region

<400> 6  
ggaggagacgtatgacttcgg t 21

<210> 7  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> reverse primer for PCR amplification of light chain variable  
region

<400> 7  
gcgcgtgactic agcccggtcctc g

21

<210> 8  
<211> 51  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> forward primer for PCR amplification of light chain variable  
region

<400> 8  
agagccacccgt ccgcctgaaac ccgcctccacc taggacggtc agggttgtcc c

51

<210> 9  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> reverse primer for PCR amplification of heavy chain variable  
region

<400> 9  
gcgcgtgacgt tggacgagtc c

21

<210> 10  
<211> 51  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> forward primer for PCR amplification of heavy chain variable  
region

<400> 10  
agagccacct ccgcctgaac cgccctccacc ggaggagacg atgacttcgg t 51

<210> 11  
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<212> DNA  
<213> Artificial Sequence

<220>  
<223> reverse primer for PCR amplification of light chain variable  
region

<400> 11  
ggcgaggatg gctctggcg tggcgatcg ggcgtgactc agccgtccctc g 51

<210> 12  
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<212> DNA  
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<220>  
<223> forward primer for PCR amplification of light chain variable  
region

<400> 12  
taggacggtc agggttgtcc c 21

<210> 13  
<211> 55  
<212> DNA  
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<220>  
<223> reverse primer for PCR amplification of scFv

<400> 13  
gtccctcgcaa ctgcggccca gcggggccat ggcggcgctg actcagccgt cctcg

55

<210> 14  
<211> 39  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> forward primer for PCR amplification of scFv

<400> 14  
ggcacacctt ggccggcgagg aggagacgt gacttgggt

39

<210> 15  
<211> 55  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> reverse primer for PCR amplification of scFv

<400> 15  
gtcctcgcaa ctgcggccca gcccggccat gcccggcgta acgttggacg agtcc 55

<210> 16  
<211> 39  
<212> DNA  
<213> Artificial Sequence

<220>  
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<400> 16  
ggccacctt gggccgccta ggacggtag ggttgtccc 39

<210> 17  
<211> 369  
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<213> chicken hybridoma cell line 2-1

<220>  
<221> CDS  
<222> (1)..(369)

<400> 17  
gcc gtg acg ttg gac gag tcc ggg gac ggc ctc cag acg ccc gga gaa 48  
Ala Val Thr Leu Asp Glu Ser Gly Gly Gly Leu Gln Thr Pro Gly Gly  
1 5 10 15

gcg ctc acg ctc gtc tcc aag gcc tcc ggg ttc acc ttc acg acg cat 96  
Ala Leu Ser Leu Val Cys Lys Ala Ser Gly Phe Thr Phe Ser Ser His  
20 25 30

ggc atg atg tgg gtg cga cag acg ccc ggc aag ggg ctg gag tgg gtc 144  
Gly Met Met Trp Val Arg Gln Thr Pro Gly Lys Gly Leu Glu Trp Val  
35 40 45

gcg ggt att agc aac act ggt act tac acg tac tac gcg cgg ggt 192  
Ala Gly Ile Ser Asn Thr Gly Thr Tyr Thr Tyr Ala Pro Ala Val  
50 55 60

aag ggc cgt gcc acc atc tgg agg gac aac ggg cag acg aca gtt agg 240  
Lys Gly Arg Ala Thr Ile Ser Arg Asp Asn Gly Gln Ser Thr Val Arg  
65 70 75 80

ctg cag ctg aac aac ctc agg gct gag gac acc ggc acc tac tac tgc 288  
Leu Gln Leu Asn Asn Leu Arg Ala Glu Asp Thr Gly Thr Tyr Tyr Cys  
85 90 95

gcc aaa ggt ggt gct tat tgt gct ggt tgg ggt gac atc gac gca 336  
Ala Lys Gly Gly Ala Tyr Cys Ala Gly Cys Gly Asp Ile Asp Ala  
100 105 110

tgg ggc cac ggg acc gaa gtc atc gtc tcc tcc 369  
Trp Gly His Gly Thr Glu Val Ile Val Ser Ser  
115 120

<210> 18

<211> 123

<212> PRT

<213> chicken hybridoma cell line 2-1

<400> 18

Ala Val Thr Leu Asp Glu Ser Gly Gly Leu Gln Thr Pro Gly Gly  
1 5 10 15

Ala Leu Ser Leu Val Cys Lys Ala Ser Gly Phe Thr Phe Ser Ser His  
20 25 30

Gly Met Met Trp Val Arg Gln Thr Pro Gly Lys Gly Leu Glu Trp Val  
35 40 45

Ala Gly Ile Ser Asn Thr Gly Thr Tyr Thr Tyr Ala Pro Ala Val  
50 55 60

Lys Gly Arg Ala Thr Ile Ser Arg Asp Asn Gly Gln Ser Thr Val Arg  
65 70 75 80

Leu Gln Leu Asn Asn Leu Arg Ala Glu Asp Thr Gly Thr Tyr Tyr Cys  
85 90 95

Ala Lys Gly Gly Ala Tyr Cys Ala Gly Cys Gly Gly Asp Ile Asp Ala  
100 105 110

Trp Gly His Gly Thr Glu Val Ile Val Ser Ser  
115 120

<210> 19

<211> 372

<212> DNA

<213> chicken hybridoma cell line 5D11

<220>

<221> CDS

<222> (1)..(372)

<400> 19

gcc gtc acg ttg gac gag tcc ggg ggc ggc ctc cag acg ccc gga gga  
Ala Val Thr Leu Asp Glu Ser Gly Gly Leu Gln Thr Pro Gly Gly  
1 5 10 15 48

gcg ctc acg ctc gtc tgc aag gcc tcc ggg ttc gac ttc acg agt tac  
Ala Leu Ser Leu Val Cys Lys Ala Ser Gly Phe Asp Phe Ser Ser Tyr  
96

20

25

30

gac atg att tgg gtg cga cag ggg ccc aag ggg ctg gaa tac gtc 144  
 Asp Met Ile Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Tyr Val

35

40

45

gcg ggt att aga agt gat ggt agt agg ata tac tac ggg gcg gcg ctg 192  
 Ala Gly Ile Arg Ser Asp Gly Ser Ser Ile Tyr Tyr Gly Ala Ala Val

50

55

60

aag ggc cgt gcc acc atc tcg agg gac aac ggg cag agc act ctg agg 240  
 Lys Gly Arg Ala Thr Ile Ser Arg Asp Asn Gly Gln Ser Thr Leu Arg

65

70

75

80

ctg cag ctg aac aac ctc agg ggt gag gag acc ggc acc tat tac tgc 288  
 Leu Gln Leu Asn Leu Arg Ala Glu Asp Thr Gly Thr Tyr Tyr Cys

85

90

95

gcc aaa agt tct tat ggt agt tgg agg ggt tct act ggt gac atc gac 336  
 Ala Lys Ser Ser Tyr Gly Ser Trp Arg Gly Ser Thr Gly Asp Ile Asp

100

105

110

gca tgg ggc cac ggg acc gaa gtc atc gtc tcc tcc 372  
 Ala Trp Gly His Gly Thr Glu Val Ile Val Ser Ser

115

120

&lt;210&gt; 20

&lt;211&gt; 124

&lt;212&gt; PRT

&lt;213&gt; chicken hybridoma cell line 5011

&lt;400&gt; 20

Ala Val Thr Leu Asp Glu Ser Gly Gly Gly Leu Gln Thr Pro Gly Gly

1

5

10

15

Ala Leu Ser Leu Val Cys Lys Ala Ser Gly Phe Asp Phe Ser Ser Tyr  
20 25 30

Asp Met Ile Trp Val Arg Gin Ala Pro Gly Lys Gly Leu Glu Tyr Val  
35 40 45

Ala Gly Ile Arg Ser Asp Gly Ser Ser Ile Tyr Tyr Gly Ala Ala Val  
50 55 60

Lys Gly Arg Ala Thr Ile Ser Arg Asp Asn Gly Gin Ser Thr Leu Arg  
65 70 75 80

Leu Gin Leu Asn Asn Leu Arg Ala Glu Asp Thr Gly Thr Tyr Tyr Cys  
85 90 95

Ala Lys Ser Ser Tyr Gly Ser Trp Arg Gly Ser Thr Gly Asp Ile Asp  
100 105 110

Ala Trp Gly His Gly Thr Glu Val Ile Val Ser Ser  
115 120

<210> 21

<211> 372

<212> DNA

<213> chicken hybridoma cell line 13C8

<220>

<221> CDS

<222> (1)..(372)

<400> 21

gcc gtg acg ttg gac gag tcc ggg ggc ggc ctc cag acg ccc gga gga 48  
Ala Val Thr Leu Asp Glu Ser Gly Gly Leu Gin Thr Pro Gly Gly  
1 5 10 15

ggg ctc agc ctc gtc tgc aag ggc tcc ggg ctc gac ttc agc agt tat	96		
Gly Leu Ser Leu Val Cys Lys Gly Ser Gly Leu Asp Phe Ser Ser Tyr			
20	25	30	
gcc atg ggt tgg gtg cga cag gca ccc ggc aag ggg ctg gaa ttc gtc	144		
Ala Met Gly Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Phe Val			
35	40	45	
gct ggt att aaa aaa aat gat ggt agt tgg aca aac tac gct gcg ccg gct	192		
Ala Gly Ile Lys Lys Asn Asp Gly Ser Trp Thr Asn Tyr Ala Pro Ala			
50	55	60	
gtg cag ggc cgt gcc acc atc tcg agg gac aac ggg caa agc aca gtc	240		
Val Gln Gly Arg Ala Thr Ile Ser Arg Asp Asn Gly Gln Ser Thr Val			
65	70	75	80
agg ctg cag ctg aac aac ctc agg gct gac gac acc ggc atc tac gtc	288		
Arg Leu Gln Leu Asn Asn Leu Arg Ala Asp Asp Thr Gly Ile Tyr Val			
85	90	95	
tgc acc aga gat gtt aat agt ggt tac cct gat gct gct gac atc gac	336		
Cys Thr Arg Asp Val Asn Ser Gly Tyr Pro Asp Ala Ala Asp Ile Asp			
100	105	110	
gca tgg ggc cac ggg acc gaa gtc atc gtc tcc tcc	372		
Ala Trp Gly His Gly Thr Glu Val Ile Val Ser Ser			
115	120		
<210> 22			
<211> 124			
<212> PRT			
<213> chicken hybridoma cell line 1308			
<400> 22			
Ala Val Thr Leu Asp Glu Ser Gly Gly Leu Gln Thr Pro Gly			

1 5 10 15

Gly Leu Ser Leu Val Cys Lys Gly Ser Gly Leu Asp Phe Ser Ser Tyr

20 25 30

Ala Met Gly Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Phe Val

35 40 45

Ala Gly Ile Lys Lys Asn Asp Gly Ser Trp Thr Asn Tyr Ala Pro Ala

50 55 60

Val Gln Gly Arg Ala Thr Ile Ser Arg Asp Asn Gly Gln Ser Thr Val

65 70 75 80

Arg Leu Gln Leu Asn Asn Leu Arg Ala Asp Asp Thr Gly Ile Tyr Val

85 90 95

Cys Thr Arg Asp Val Asn Ser Gly Tyr Pro Asp Ala Ala Asp Ile Asp

100 105 110

Ala Trp Gly His Gly Thr Glu Val Ile Val Ser Ser

115 120

<210> 23

<211> 375

<212> DNA

<213> chicken hybridoma cell line 8C3

<220>

<221> CDS

<222> (1)..(375)

<400> 23

gcc gtg acg ttg gac gag tcc ggg ggc ggc ctc cag acg ccc gga gga 48

Ala Val Thr Leu Asp Glu Ser Gly Gly Leu Glu Gln Thr Pro Gly Gly

1	5	10	15	
ggc ctc agc ctc gtc tgc aag gcc tcc ggg ttc tct atc ggc ggt tac Gly Leu Ser Leu Val Cys Lys Ala Ser Gly Phe Ser Ile Gly Gly Tyr				96
20	25	30		
atc atg cac tgg gtg cgc cag acg cct gga aag ggg ctg gaa tac gtt Ile Met His Trp Val Arg Gln Thr Pro Gly Lys Gly Leu Glu Tyr Val				144
35	40	45		
gca ggt att gat gct ggt ggt ggt agc aca tac tac ggg gca gca gtg Ala Gly Ile Asp Ala Gly Gly Ser Thr Tyr Gly Ala Ala Val				192
50	55	60		
cag ggc cgt gcc acc gtc tcg agg gac aac ggg cag agc aca ctg agg Gln Gly Arg Ala Thr Val Ser Arg Asp Asn Gly Gln Ser Thr Leu Arg				240
65	70	75	80	
ctg cag ctg aac aac ctc agg ctg gag gag acc ggc acc tac tac ttc tgc Leu Gln Leu Asn Leu Arg Leu Glu Asp Thr Gly Thr Tyr Phe Cys				288
85	90	95		
gcc aaa gct tct cgg tgt ggc tat gat tgg tgt tct gct gat gac aac atc Ala Lys Ala Ser Arg Cys Gly Tyr Asp Trp Cys Ser Ala Asp Asn Ile				336
100	105	110		
gac gca tag ggc cac ggg acc gaa gtc atc gtc tcc Asp Ala Trp Gly His Gly Thr Glu Val Ile Val Ser Ser				375
115	120	125		

<210> 24  
 <211> 125  
 <212> PRT  
 <213> chicken hybridoma cell line 8C3

<400> 24

Ala Val Thr Leu Asp Glu Ser Gly Gly Gly Leu Gin Thr Pro Gly Gly

1

5

10

15

Gly Leu Ser Leu Val Cys Lys Ala Ser Gly Phe Ser Ile Gly Gly Tyr

20

25

30

Ile Met His Trp Val Arg Gin Thr Pro Gly Lys Gly Leu Glu Tyr Val

35

40

45

Ala Gly Ile Asp Ala Gly Gly Ser Thr Tyr Tyr Gly Ala Ala Val

50

55

60

Gin Gly Arg Ala Thr Val Ser Arg Asp Asn Gly Gin Ser Thr Leu Arg

65

70

75

80

Leu Gin Leu Asn Asn Leu Arg Leu Glu Asp Thr Gly Thr Tyr Phe Cys

85

90

95

Ala Lys Ala Ser Arg Cys Gly Tyr Asp Trp Cys Ser Ala Asp Asn Ile

100

105

110

Asp Ala Trp Gly His Gly Thr Glu Val Ile Val Ser Ser

115

120

125

<210> 25

<211> 324

<212> DNA

<213> chicken hybridoma cell line 2-1

<220>

<221> CDS

<222> (1)..(324)

<400> 25

gct ctg act cag cgg tcc tcg gtg tca gca aac cca gga gaa acc gtc	48
Ala Leu Thr Gln Pro Ser Ser Val Ser Ala Asn Pro Gly Glu Thr Val	
1 5 10 15	
 aag atc acc tgc tcc ggg ggt ggc agc tac gct gga agt tac tat tat	96
Lys Ile Thr Cys Ser Gly Gly Ser Tyr Ala Gly Ser Tyr Tyr Tyr	
20 25 30	
 ggc tgg tac cag cag aag gca cct gcc agt gcc cct gtc act gtg atc	144
Gly Trp Tyr Gln Gln Lys Ala Pro Ala Ser Ala Pro Val Thr Val Ile	
35 40 45	
 tat gac aac acc aac aga ccc tcg aac atc cct tca cga ttc tcc ggt	192
Tyr Asp Asn Thr Asn Arg Pro Ser Asn Ile Pro Ser Arg Phe Ser Gly	
50 55 60	
 tcc cta tcc ggc tcc aca aac aca tta acc atc act ggg gtc caa gtc	240
Ser Leu Ser Gly Ser Thr Asn Thr Leu Thr Ile Thr Gly Val Gln Val	
65 70 75 80	
 gag gac gag gct gtc tat tac tgt ggg agc ttc gac agc agt tat gtt	288
Glu Asp Glu Ala Val Tyr Tyr Cys Gly Ser Phe Asp Ser Ser Tyr Val	
85 90 95	
 ggt ata ctt ggg gcc ggg aca acc ctg acc gtc cta	324
Gly Ile Leu Gly Ala Gly Thr Thr Leu Thr Val Leu	
100 105	

<210> 26

<211> 108

<212> PRT

<213> chicken hybridoma cell line 2-1

<400> 26

Ala Leu Thr Gln Pro Ser Ser Val Ser Ala Asn Pro Gly Glu Thr Val

1 5 10 15

Lys Ile Thr Cys Ser Gly Gly Gly Ser Tyr Ala Gly Ser Tyr Tyr Tyr  
20 25 30

Gly Trp Tyr Gin Gin Lys Ala Pro Ala Ser Ala Pro Val Thr Val Ile  
35 40 45

Tyr Asp Asn Thr Asn Arg Pro Ser Asn Ile Pro Ser Arg Phe Ser Gly  
50 55 60

Ser Leu Ser Gly Ser Thr Asn Thr Leu Thr Ile Thr Gly Val Gin Val  
65 70 75 80

Glu Asp Glu Ala Val Tyr Tyr Cys Gly Ser Phe Asp Ser Ser Tyr Val  
85 90 95

Gly Ile Leu Gly Ala Gly Thr Thr Leu Thr Val Leu  
100 105

<210> 27  
<211> 312  
<212> DNA  
<213> chicken hybridoma cell line 5D11

<220>  
<221> CDS  
<222> (1)..(312)

<400> 27

gct ctg act cag cgg tcc tcg gtg tca gca aac ctg gga gaa acc gtc  
Ala Leu Thr Gin Pro Ser Ser Val Ser Ala Asn Leu Gly Glu Thr Val  
1 5 10 15

gaa atc acc tgc tcc ggg ggc agg tat agg tat ggc tgg tat cag cag 48  
96

Glu	Ile	Thr	Cys	Ser	Gly	Gly	Arg	Tyr	Gly	Trp	Tyr	Gln	Gln			
20	25	30														
aag	tca	tct	ggc	agt	gcc	cct	gtc	act	gtg	atc	tat	gac	aac	gac	aag	144
Lys	Ser	Ser	Gly	Ser	Ala	Pro	Val	Thr	Val	Ile	Tyr	Asp	Asn	Asp	Lys	
35															45	
aga	ccc	tcc	gac	atc	cct	tca	cga	ttc	tcc	ggt	tcc	aaa	tcc	gac	tcc	192
Arg	Pro	Ser	Asp	Ile	Pro	Ser	Arg	Phe	Ser	Gly	Ser	Lys	Ser	Asp	Ser	
50															60	
acg	ggc	aca	tta	acc	atc	act	ggg	gtc	caa	gcc	gag	gac	gag	gac	gtc	240
Thr	Gly	Thr	Leu	Thr	Ile	Thr	Gly	Val	Gln	Ala	Glu	Asp	Glu	Ala	Val	
65															80	
tat	tac	tgt	ggg	aat	gca	gac	aac	aat	act	tac	gat	cct	ata	ttt	ggg	288
Tyr	Tyr	Cys	Gly	Asn	Ala	Asp	Asn	Asn	Asn	Thr	Tyr	Asp	Pro	Ile	Phe	Gly
															95	
gcc	ggg	aca	acc	ctg	acc	gtc	cta									312
Ala	Gly	Thr	Thr	Leu	Thr	Val	Leu									
															100	
<210> 28																
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<212> PRT																
<213> chicken hybridoma cell line 5011																
<400> 28																
Ala	Leu	Thr	Gln	Pro	Ser	Ser	Val	Ser	Ala	Asn	Leu	Gly	Glu	Thr	Val	
1															15	
Glu	Ile	Thr	Cys	Ser	Gly	Gly	Arg	Tyr	Gly	Trp	Tyr	Gln	Gln			
20															30	

Lys Ser Ser Gly Ser Ala Pro Val Thr Val Ile Tyr Asp Asn Asp Lys  
35 40 45

Arg Pro Ser Asp Ile Pro Ser Arg Phe Ser Gly Ser Lys Ser Asp Ser  
50 55 60

Thr Gly Thr Leu Thr Ile Thr Gly Val Gln Ala Glu Asp Glu Ala Val  
65 70 75 80

Tyr Tyr Cys Gly Asn Ala Asp Asn Asn Thr Tyr Asp Pro Ile Phe Gly  
85 90 95

Ala Gly Thr Thr Leu Thr Val Leu  
100

<210> 29

<211> 324

<212> DNA

<213> chicken hybridoma cell line 13C8

<220>

<221> CDS

<222> (1)..(324)

<400> 29

gct ctg act cag cgg tcc tgc ggc tca gca aac ctg gga gga acc gtc  
Ala Leu Thr Gln Pro Ser Ser Val Ser Ala Asn Leu Gly Thr Val  
1 5 10 15

aag atc acc tgc tcc ggg ggc agc tat ggc tat ggc tgg ttc cag cag  
Lys Ile Thr Cys Ser Gly Gly Ser Tyr Gly Tyr Trp Phe Gln Gln  
20 25 30

aag tca cct ggc agt gcc cct gtc cct gtc atc tac tgg aac aac aag  
Lys Ser Pro Gly Ser Ala Pro Val Pro Val Ile Tyr Trp Asn Asn Lys  
144

35

40

45

aga ccc tcg gac atc cct tca cga ttc tcc ggt tcc aaa tcc ggc tcc 192  
Arg Pro Ser Asp Ile Pro Ser Arg Phe Ser Gly Ser Lys Ser Gly Ser

50

55

60

aca gcc aca tta acc atc act ggg gtc cga gcc gag gag gag gct gtc 240  
Thr Ala Thr Leu Thr Ile Thr Gly Val Arg Ala Glu Asp Glu Ala Val  
65 70 75 80

tat tac tgt ggg aat gca gac agc aat act act gct gat agt gat tat gtt 288  
Tyr Tyr Cys Gly Asn Ala Asp Ser Asn Thr Ala Asp Ser Asp Tyr Val  
85 90 95

ggt ata ttt ggg gcc ggg aca acc ctg acc gtc cta 324  
Gly Ile Phe Gly Ala Gly Thr Thr Leu Thr Val Leu  
100 105

&lt;210&gt; 30

&lt;211&gt; 108

&lt;212&gt; PRT

&lt;213&gt; chicken hybridoma cell line 1303

&lt;400&gt; 30

Ala Leu Thr Gln Pro Ser Ser Val Ser Ala Asn Leu Gly Gly Thr Val  
1 5 10 15

Lys Ile Thr Cys Ser Gly Gly Ser Tyr Gly Tyr Gly Trp Phe Gln Gln  
20 25 30

Lys Ser Pro Gly Ser Ala Pro Val Pro Val Ile Tyr Trp Asn Asn Lys  
35 40 45

Arg Pro Ser Asp Ile Pro Ser Arg Phe Ser Gly Ser Lys Ser Gly Ser  
50 55 60

Thr Ala Thr Leu Thr Ile Thr Gly Val Arg Ala Glu Asp Glu Ala Val  
65 70 75 80

Tyr Tyr Cys Gly Asn Ala Asp Ser Asn Thr Ala Asp Ser Asp Tyr Val  
85 90 95

Gly Ile Phe Gly Ala Gly Thr Thr Leu Thr Val Leu  
100 105

<210> 31

<211> 315

<212> DNA

<213> chicken hybridoma cell line BC3

<220>

<221> CDS

<222> (1)..(315)

<400> 31

gcg ctg act caa ccg tcc tcg gtg tca gcg atc ccg gga gaa acc gtc 48  
Ala Leu Thr Gln Pro Ser Ser Val Ser Ala Ile Pro Gly Glu Thr Val  
1 5 10 15

gag atc acc tgc tcc ggg ggt aac aac tac tat ggc tgg tat cag cag 96  
Glu Ile Thr Cys Ser Gly Gly Asn Asn Tyr Tyr Gly Trp Tyr Gln Gln  
20 25 30

aaa tca cct ggc agt gcc cct gtc act gtg atc tac tac aac aac aag 144  
Lys Ser Pro Gly Ser Ala Pro Val Thr Val Ile Tyr Tyr Asn Asn Lys  
35 40 45

aga ccc tcc gac atc cct tca cga ttc tcc ggt tcc aaa ccc ggc tcc 192  
Arg Pro Ser Asp Ile Pro Ser Arg Phe Ser Gly Ser Lys Pro Gly Ser  
50 55 60

aca aac aca tta acc atc act ggg gtc cga gcc gag gag gac gac gtc  
Thr Asn Thr Leu Thr Ile Thr Gly Val Arg Ala Glu Asp Glu Ala Val  
65 70 75 80

tat ttc tgt ggt gcc tgg gaa agt agt cct att tat gtt ggt ata ttt  
Tyr Phe Cys Gly Ala Trp Glu Ser Ser Pro Ile Tyr Val Gly Ile Phe  
85 90 95

ggg gcc ggg aca acc ctg acc gtc cta  
Gly Ala Gly Thr Thr Leu Thr Val Leu  
100 105

<210> 32  
<211> 105  
<212> PRT  
<213> chicken hybridoma cell line 8C3

<400> 32  
Ala Leu Thr Gln Pro Ser Ser Val Ser Ala Ile Pro Gly Glu Thr Val  
1 5 10 15

Glu Ile Thr Cys Ser Gly Gly Asn Asn Tyr Tyr Gly Trp Tyr Gln Gln  
20 25 30

Lys Ser Pro Gly Ser Ala Pro Val Thr Val Ile Tyr Tyr Asn Asn Lys  
35 40 45

Arg Pro Ser Asp Ile Pro Ser Arg Phe Ser Gly Ser Lys Pro Gly Ser  
50 55 60

Thr Asn Thr Leu Thr Ile Thr Gly Val Arg Ala Glu Asp Glu Ala Val  
65 70 75 80

Tyr Phe Cys Gly Ala Trp Glu Ser Ser Pro Ile Tyr Val Gly Ile Phe

85

90

95

Gly Ala Gly Thr Thr Leu Thr Val Leu

100

105

<210> 33

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> reverse primer for PCR amplification of heavy chain variable region

<400> 33

Ala Val Thr Leu Asp Glu Ser

1

5

<210> 34

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> forward primer for PCR amplification of heavy chain variable region

<400> 34

Ser Ser Val Ile Val Glu Thr

1

5

<210> 35  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> reverse primer for PCR amplification of light chain variable region

<400> 35  
Ala Leu Thr Gln Pro Ser Ser  
1 5

<210> 36  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> forward primer for PCR amplification of light chain variable region

<400> 36  
Leu Val Thr Leu Thr Thr Gly  
1 5

<210> 37  
<211> 381  
<212> DNA  
<213> chicken hybridoma cell line 6D-12-G10

<220>

<221> CDS

<222> (1)..(381)

<400> 37

gcc gtg acg ttg gac gag tcc ggg ggc ggc ctc cag acg ccc gga aga 48  
Ala Val Thr Leu Asp Glu Ser Gly Gly Gly Leu Gin Thr Pro Gly Arg  
1 5 10 15

gct ctc acg ctc gtc tgc aag gcc tcc ggg ttc acc ttc acg agt tat 96  
Ala Leu Ser Leu Val Cys Lys Ala Ser Gly Phe Thr Phe Ser Ser Tyr  
20 25 30

ggc atg gtc tgg gtg cga cag gct ccc ggc aag ggg ctg gaa tac gtc 144  
Gly Met Val Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Tyr Val  
35 40 45

gct gaa att atc aca act ggt aga gac aca tgg tat ggg acg gct gtc 192  
Ala Glu Ile Ile Thr Thr Gly Arg Asp Thr Trp Tyr Gly Thr Ala Val  
50 55 60

aag ggc cgt gcc acc atc tcg agg gac aac ggg cag agt aca gtg agg 240  
Lys Gly Arg Ala Thr Ile Ser Arg Asp Asn Gly Gln Ser Thr Val Arg  
65 70 75 80

ctg cag ctg aac aac ctc agg gct gaa gac acc ggc atc tac tac tgc 288  
Leu Gln Leu Asn Asn Leu Arg Ala Glu Asp Thr Gly Ile Tyr Tyr Cys  
85 90 95

gcc aaa tgc agt tat gag tgt act agt agt tgt tgg ggt tat act gat 336  
Ala Lys Cys Ser Tyr Glu Cys Thr Ser Ser Cys Trp Gly Tyr Thr Asp  
100 105 110

atg atc gac gca tgg ggc cac ggg acc gaa gtc atc gtc tcc tcc 381  
Met Ile Asp Ala Trp Gly His Gly Thr Glu Val Ile Val Ser Ser  
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<213> chicken hybridoma cell line 6D-12-G10

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1 5 10 15

Ala Leu Ser Leu Val Cys Lys Ala Ser Gly Phe Thr Phe Ser Ser Tyr

20 25 30

Gly Met Val Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Tyr Val

35 40 45

Ala Glu Ile Ile Thr Thr Gly Arg Asp Thr Trp Tyr Gly Thr Ala Val

50 55 60

Lys Gly Arg Ala Thr Ile Ser Arg Asp Asn Gln Ser Thr Val Arg

65 70 75 80

Leu Gln Leu Asn Asn Leu Arg Ala Glu Asp Thr Gly Ile Tyr Tyr Cys

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Ala Lys Cys Ser Tyr Glu Cys Thr Ser Ser Cys Trp Gly Tyr Thr Asp

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Met Ile Asp Ala Trp Gly His Gly Thr Glu Val Ile Val Ser Ser

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Lys Ile Thr Cys Ser Gly Ser Ser Gly Ser Tyr Gly Trp Tyr Gln Gln  
20 25 30

aag tca cct ggc agt gcc cct gtc act gtg atc tat tac aac gac aag 144  
Lys Ser Pro Gly Ser Ala Pro Val Thr Val Ile Tyr Tyr Asn Asp Lys  
35 40 45

aga ccc tcc gac atc cct tca cga ttc tcc ggt tcc aaa tcc ggc tcc 192  
Arg Pro Ser Asp Ile Pro Ser Arg Phe Ser Gly Ser Lys Ser Gly Ser  
50 55 60

acg ggc aca tta acc atc act ggg gtc caa gcc gag gac gag gct gtc 240  
Thr Gly Thr Leu Thr Ile Thr Gly Val Gln Ala Glu Asp Glu Ala Val  
65 70 75 80

tat ttc tgt gag agt aca gac tac agt agt act gat ata ttt ggg gcc 288  
Tyr Phe Cys Glu Ser Thr Asp Tyr Ser Ser Thr Asp Ile Phe Gly Ala  
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Gly Thr Thr Leu Thr Val Leu Gly  
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1 5 10 15

Lys Ile Thr Cys Ser Gly Ser Ser Gly Ser Tyr Gly Trp Tyr Gln Gln

20 25 30

Lys Ser Pro Gly Ser Ala Pro Val Thr Val Ile Tyr Tyr Asn Asp Lys

35 40 45

Arg Pro Ser Asp Ile Pro Ser Arg Phe Ser Gly Ser Lys Ser Gly Ser

50 55 60

Thr Gly Thr Leu Thr Ile Thr Gly Val Gln Ala Glu Asp Glu Ala Val

65 70 75 80

Tyr Phe Cys Glu Ser Thr Asp Tyr Ser Ser Thr Asp Ile Phe Gly Ala

85 90 95

Gly Thr Thr Leu Thr Val Leu Gly

100